USSN 10/089,253

SUBSTITUTE SPECIFICATION

CLEAN COPY

OK TO ENTER: /R.R./

FIELD

The present invention is concerned with a method for controlling a vending machine and charging of a dispensed item of merchandise that incorporates a mobile radiocommunication transmit/receive unit and can be called from a user's mobile telephone end unit (7) over a mobile telephone network (8) via an (abbreviated) mobile telephone number affixed on the vending machine, wherein the vending machine (19) prompts the user to select the merchandise and, after the merchandise has been dispensed, generates a billing entry.

BACKGROUND

Patent document WO-A-99 22346 reveals a method for controlling a vending machine and charging of a dispensed item of merchandise using a mobile telephony system. A user can order an item of merchandise from the vending machine with his mobile telephone by dialing a vending machine telephone number that is displayed on the vending machine. The item of merchandise is charged with the aid of billing data that are matched to the user's telephone number and billed with his telephone bill.

A method for controlling a vending machine and charging of a dispensed item of merchandise using a mobile telephony system is also known from patent document JP-A-08249530 A. The user can control a vending machine with his mobile telephone in such a way that he is recognized by the system based on his telephone number. Billing data are generated that are transmitted to a billing center, where the incurred costs are charged.

The present invention is based on the following object (problem):
A method shall be presented for a simple control of a vending machine and a simple and

cashless charging of the dispensed item of merchandise.

SUMMARY

This object is met with a method for controlling and operating a vending machine (1) that incorporates a mobile radiocommunication transmit/receive unit and can be called from a user's mobile telephone end unit (7) over a mobile telephone network (8) via an (abbreviated) mobile telephone number affixed on the vending machine, wherein the vending machine (19) prompts the user to select the merchandise and, after the merchandise has been dispensed, generates a billing entry, characterized in that the billing entry is settled via a payment gateway (4) that has access to a mini-payment account the user has opened with a bank (5), the mini-payment account number of which is determined based on the user's mobile telephone number.

A vending machine has a mobile radiocommunication transmit/receive unit, e.g., a GSM module, and can be called by the customer from his mobile telephone via an (abbreviated) mobile telephone number affixed on the vending machine. The vending machine prompts the customer to select the merchandise and, after dispensing the item of merchandise, generates a billing entry that must be settled. In the case of prepaid customers, a balance verification must be performed prior to dispensing the merchandise.

Advantages compared to the prior art

The known methods for charging for transactions or services via a telecommunications network require that a mini-payment account be kept directly in the IN-SCP. This requires the operator to have a banking license. This is circumvented in the present invention in such a way that an account with an outside banking organization is accessed.

The voice access to the vending machine is an important simplification for the GSM user compared, e.g., to the SMS access. Furthermore, the reservation process permits an online verification of available funds and the electronic billing entry can nevertheless be processed offline. The reservation and billing entry can be uniquely matched to one another based on the telephone numbers.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 shows an example of an inventive system architecture.

DETAILED DESCRIPTION

The vending machine 1, 1' incorporates a GSM module and a GSM telephone number. Merchandise with different prices can be selected from the vending machine. Displayed on the vending machine is an (abridged) telephone number.

The IN-SCP 2 (Intelligent-Network Service Control Point) incorporates a database 3 in which the abridged number of the vending machine is mapped to an unabridged telephone number. This can be done using the location information from the call data of the call placed by the GSM user. The IN-SCP is furthermore also connected to a payment gateway 4.

The payment gateway 4 has online access to a mini-payment account, which is kept at a bank 5. In the payment database 6, a mini-payment account number has been established for each user. The current account information is known in the payment database 6 at all times through regular comparison or online access to the bank 5.

The GSM user is standing in front of a vending machine 1, 1' with his mobile telephone unit 7. He dials the (abbreviated) telephone number displayed on the vending machine. In the MSC 8, it is detected that this is a special number that needs to be analyzed in the IN-SCP 2. From the MSC, a communication line is established to the IN-SCP, and the telephone

number of the GSM user, the dialed telephone number, and the GSM user's location are transmitted.

The IN-SCP 2 determines the vending machine's actual telephone number. At the same time it establishes a connection to the payment gateway 4 and requests that a maximum amount of, e.g., DM 5.00, be reserved with reference to the vending machine on the account of the GSM user who has been uniquely identified by his telephone number.

The payment gateway 4 determines, based on the GSM user's telephone number, his mini-payment account number and the current account balance. If there are sufficient funds, the reservation is carried out with a reference to the vending machine telephone number and acknowledged positive to the IN-SCP 2. A reserved amount is not available for other payments until it has been cleared. The reservation is acknowledged negative if there are insufficient funds, if the customer is listed on a black list, or if he does not have an account. If the acknowledgement from the payment gateway is negative, the IN-SCP 2 informs the MSC 8 that the connection should be terminated. The MSC 8 can play a recording to the user stating the reason for the terminated connection. If the payment gateway 4 acknowledgment is positive, the IN-SCP 2 informs the MSC 8 of the unabridged telephone number of the vending machine. The MSC 8 establishes a voice connection to the vending machine 1, 1'. The vending machine 1, 1' identifies, from the ISDN signal, the telephone number of the GSM user and prompts the user to select an item of merchandise. The user communicates with the vending machine via his mobile telephone 7. The vending machine 1, 1' can, at that time, also play a recording for the user. After that, the SGM connection between the user and vending machine can be initiated by the vending machine 1, 1'. The user now pushes a selection button, the merchandise is dispensed and the vending machine 1, 1' generates an electronic billing entry. The billing entry includes, e.g., the vending machine telephone number, the GSM user's telephone number, merchandise identification and price. It is transmitted by the vending machine 1, 1', e.g., via a GSM short message or GSM USSD, to the payment gateway 4.

The payment gateway 4 receives the electronic billing entry and determines, based on the user's GSM telephone number, his mini-payment account. It recognizes, based on the vending machine telephone number, the reservation that was previously made by the IN-SCP 2 and clears the same. The price for the merchandise is debited to the user's account and credited, by means of a credit entry, to the account of the vending machine operator.

The connection between the reservation and billing entry can also be made with the aid of a reference number. When a reservation is made, the payment gateway 4 issues a reference number and communicates the same to the IN-SCP 2 as part of the positive acknowledgement. The IN-SCP 2 transmits it to the vending machine 1, 1' when establishing the connection, e.g., as a UUS parameter or as a subaddress. The vending machine 1, 1' adds this reference number to the billing entry and the payment gateway 4 can uniquely match the reservation and billing entry. The payment gateway 4 automatically clears a reservation after a predefined maximum time if no billing entry has arrived from the vending machine 1, 1' by then. The reserved funds are then available again for other payments.